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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.												
10/760,037	01/15/2004	Stan W. Livingston	PD-03W006	8483												
7590 Leonard A. Alkov, Esq. Raytheon Company P.O. Box 902 (E4/N119) El Segundo, CA 90245-0902		05/18/2007	<table border="1"><tr><td colspan="2">EXAMINER</td></tr><tr><td colspan="2">VU, JIMMY T</td></tr><tr><td>ART UNIT</td><td>PAPER NUMBER</td></tr><tr><td>2821</td><td></td></tr><tr><td>MAIL DATE</td><td>DELIVERY MODE</td></tr><tr><td>05/18/2007</td><td>PAPER</td></tr></table>		EXAMINER		VU, JIMMY T		ART UNIT	PAPER NUMBER	2821		MAIL DATE	DELIVERY MODE	05/18/2007	PAPER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/760,037	<b>Applicant(s)</b> LIVINGSTON ET AL.	
	<b>Examiner</b> Jimmy T. Vu	<b>Art Unit</b> 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 13-21, 37, 39 and 40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 37 is/are allowed.
- 6) ☒ Claim(s) 13, 14, 19-21, 39 and 40 is/are rejected.
- 7) ☒ Claim(s) 15-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 37, 39 and 40 are objected to because of the following informalities:  
In claims 37, 39 and 40, line 5 of each claim, change "the ground plane structure" to --the conductor plane structure--.  
Appropriate correction is required.
2. The indicated allowability of claims 13-21, 37, 39 and 40 are withdrawn in view of the newly discovered reference(s) to U.S. Patent 5,086,304. Rejections based on the newly cited reference(s) follow.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 13-14, 19-21, 39 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Collins (US Patent 5,086,304).

Regarding claim 13, Collins discloses a dual polarization antenna array (10, col. 6, lines 42-44 Figs 1-15), comprising:

Art Unit: 2821

first and second arrays (12, col. 6, line 45) of continuous slots (22) formed in a ground plane structure (16, col. 7, lines 13-16 and further in col. 2, lines 43-45); said second array orthogonal to said first array (Figs. 1-3 show the orthogonal arrays) to define a checker-board pattern of conductive pads (conductive metal film 43 (Fig. 2, col. 7, lines 16-22) contact with the low surface of orthogonal arrays to define a checker board pattern of conductive pads) in the ground plane structure (16); first and second feed structure (46, col. 7, lines 26-27, Fig. 9) comprising first and second periodically spaced set of probe feeds (plurality of feeds 46) disposed behind the ground plane structure (16) for exciting the first and second arrays of slots (the probe feed structures 46 formed on either layers 18 and 20 behind the ground layer 16, see Figs. 4 and 9).

Regarding claim 14, Collins further comprising an electrically conductive back plane structure (18, 20) (Figs. 4, 5 and 9) arranged behind the first and second sets of probe feeds (46) such that the probe feeds are between the ground plane structure (16) and the back plane structure (18, 20, see Fig. 4), the back plane structure providing RF shielding (the material of layers 18 and 20 made of insulated material or plastic, see col. 6, lines 58-59).

Regarding claim 19, Collins discloses said ground plane structure (16) (see Fig. 2) is a planar structure.

Regarding claim 20, Collins discloses the probe feeds (46) each comprise a pair of feed wires (58, col. 7, lines 46-48) each connected to a feed wire portion (the portion on a surface of the layer 20), which is positioned in a general parallel orientation relative

Art Unit: 2821

to the ground plane structure (16) (see Fig. 2), the layer 20 is formed parallel in direction to the layer 16) (Fig. 2).

Regarding claim 21, Collins discloses the array operates in a band between 4 GHz and 16 GHz (col. 6, lines 51-52).

Regarding claims 39 and 40, Collins discloses an antenna array (Figs. 1-15), comprising: an array of continuous slots (12, Figs. 2 and 3) formed in a conductor plane structure (16, Fig. 2) (conductive metal film 43 coated on the plane 16); a balanced push-pull feed structure (46, Figs. 4 and 9) for exciting the array of continuous slots, the balanced push-pull feed structure comprising a periodic set of probe feeds (46) disposed behind the conductor plane structure; and

a back plane structure (18 and 20) comprising a conductive layer (metal film, col. 7, line 68) disposed behind the set of probe feeds and spaced a distance S1 (thickness of layer 18, Fig. 9) from the conductor plane structure, such that the set of probe feeds is sandwiched between the conductor plane structure (16) and the back plane structure (18 and 20) (Figs. 2, 4 and 9);

wherein the array operates in a UHF operating band, or between 4GHz to 16GHz (the operating band in a range having frequency at 12 GHz, refer to col. 8, line 65).

***Allowable Subject Matter***

5. Claim 37 is allowed.

Art Unit: 2821

6. Claims 15-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Neither the cited references cited nor the references cited teaches or suggests or obviously in combination thereof the antenna array, particularly," wherein said S 1 distance is greater than 12% of a mid-band wavelength and less than 60% of the mid-band wavelength" (claim 37), and "each of the first and second feed structures comprises a balanced push-pull feed respectively coupled to each of the first and second sets of probe feeds and comprising a pair of feed lines driven in anti-phase" (claim 5).

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 13-21, 37, 39 and 40 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References Park (U.S. Patent 6,166,701) is cited.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy T Vu whose telephone number is (571) 272-1832. The examiner can normally be reached on M - F: 9 - 6:00.

Art Unit: 2821

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on (571) 272-1662. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2800.

Jimmy Vu

May 09, 2007

*Douglas W. Owens* 5/11/07

DOUGLAS W. OWENS  
SUPERVISORY PATENT EXAMINER